Radio Burst for the White Light, *A. E. Covington*, 332.

G

Gaizauskas, Barbara R., The Harmony of the Spheres, 146.

Galaxies, Morphological Properties of Some Bright Southern, *R. F. Garrison* and *N. R. Walborn*, 117.

Garrison, R. F., Morphological Properties of Some Bright Southern Galaxies (with N. R. Walborn), 117.

U Geminorum and Z Camelopardalis Type Variables During 1973, Notes on, 169.

Goldberg, B. A., The Orbit and Nature of θ^2 Orionis A (with G. C. L. Aikman), 205.

Gravity and its Astronomical Implications: An Elementary Guide, *Ray Skinner*, 173, 237, 307.

H

Halliday, Ian (see Review of Publications).

Hardie, Robert H., Georges van Biesbroeck, 1880–1974, 202.

Harmony of the Spheres, The, *Barbara R. Gaizauskas*, 146.

Heard, J. F. (see Review of Publications).

Higgs, L. A., Note on the Widths of Radio Spectral Lines from Planetary Nebulae, 295.

Hill, Graham, Fifteenth General Assembly of the International Astronomical Union, Sydney, Australia, August 21–30, 1973, 89.

Historic 15-inch Refractor Removed from Dome in Ottawa, 272.

Hogg, Helen Sawyer (see Review of Publications).

Hube, D. P., Radial Velocities of Stars with Moderately Broad-Lined Spectra, 143 (see also Review of Publications).

Hutchings, J. B. (see Notes from Observatories).

I

International Astronomical Union, Fifteenth General Assembly of the, Sydney, Australia, August 21–30, 1973, *Graham Hill*, 89.

Interplanetary Material, *Peter M. Millman*, 13.

Interstellar Molecules—A Review of Recent Developments, *B. E. Turner*, 55.

K

Kennedy, J. E. (see Notes).

Kirton, Kenneth A., Distribution of Giant M and Carbon Stars in a Region in Puppis ($l = 246°$, $b = -0.°6$) (with M. Pim FitzGerald), 154.

M

MacLeod, John (see Review of Publications).

Mattei, Janet Akyüz (see Variable Star Notes).

McCutcheon, W. H., The 4.57m Millimetre Wave Telescope at the University of British Columbia (with W. L. H. Shuter), 301.

Meteoritical Society—Annual Meeting, *J. E. Kennedy* and *M. R. Dence*, 41.

4.57m Millimetre Wave Telescope at the University of British Columbia, The, *W. L. H. Shuter* and *W. H. McCutcheon*, 301.

Millman, Peter M., Interplanetary Material, 13.

Modern Instrumentation for Optical Astronomy, *Francis J. Ahern*, 99.

Molecules, Interstellar—A Review of Recent Developments, *B. E. Turner*, 55.

Morphological Properties of Some Bright Southern Galaxies, *R. F. Garrison* and *N. R. Walborn*, 117.

N

New Director of Royal Greenwich Observatory, *J. E. Kennedy*, 42.

Newton, J. B., Observations of Comet Kohoutek, 152.

Normandin, Martine, Henri Simard, 1922–1973 (with Malcolm M. Thomson), 53.
Note on the Widths of Radio Spectral Lines from Planetary Nebulae, *L. A. Higgs*, 295.
Notes, 41, 268.
Notes from Observatories (*Hutchings*), 109, 275.

O

Observations of Comet Kohoutek, *J. B. Newton*, 152.
Optical Astronomy, Modern Instrumentation for, *Francis J. Ahern*, 99.
Orbit and Nature of Θ^2 Orionis A, The, *G. C. L. Aikman* and *B. A. Goldberg*, 205.
Origin of the Chemical Elements and Stellar Evolution, *R. L. Sears*, 1.

P

Peculiarities on AAVSO Light Curves in 1973, Notes on, 112.
Percy, John R. (see Review of Publications).
Period for the Slowly Varying Component of the Solar Radio Flux, A 10.5 Year, *A. E. Covington*, 31.
Pike, Robert, White Light Observation of a Solar Flare, July 4, 1974, 330.
Pineault, Serge (see Review of Publications).
Planetarium Educators to Meet in October, 43.
Planetarium Programs, 274.
Presentation of Canadian Spectrograph to Polish Observatory, 268.

R

Radial Velocities of Stars with Moderately Broad-Lined Spectra, *D. P. Hube*, 143.
Radio Burst for the White Light Flare of July 4, 1974, Comments on the, *A. E. Covington*, 332.
Radio Spectral Lines from Planetary Nebulae, Note on the Widths of, *L. A. Higgs*, 295.
ReVelle, Douglas O. (see Review of Publications).
Review of Publications
Batten, Alan H., Binary and Multiple Systems of Stars, *J. F. Heard*, 219.
Berendzen, Richard, Education in and History of Modern Astronomy, *J. L. Climenhaga*, 44.
Berendzen, Richard, editor, Life Beyond Earth and the Mind of Man, *Ian Halliday*, 164.
Böhme, S., W. Fricke, U. Güntzel-Lingner, F. Henn, D. Krahn, U. Scheffer, G. Zeck, editors, Astronomy and Astrophysics Abstracts, Volume 9, Literature 1973, Part 1, *John R. Percy*, 279.
DeWitt, C. and B. S. DeWitt, editors, Black Holes, *R. C. Roeder*, 46.
Field, George B., Halton Arp and John N. Bahcall, The Redshift Controversy, *John MacLeod*, 277.
Glass, I. I., Shock Waves and Man, *Douglas O. ReVelle*, 335.
Heidmann, Jean, Introduction à la cosmologie, *Serge Pineault*, 111.
Jaki, Stanley L., The Milky Way: An Elusive Road for Science, *J. D. Fernie*, 45.
Misner, C. W., K. S. Thorne and J. A. Wheeler, Gravitation, *R. C. Roeder*, 164.
Smith, Elske v.P. and Kenneth C. Jacobs, Introductory Astronomy and Astrophysics, *Douglas P. Hube*, 278.
Sulentic, Jack W. and William C. Tifft, The Revised New General Catalogue of Nonstellar Astronomical Objects, *Helen Sawyer Hogg*, 167.
van der Waerden, Bartel L., Science Awakening II—The Birth of Astronomy, *Charles H. Smiley*, 276.
(see also List of Books Received for Review, 168.)

Roeder, R. C. (see Review of Publications).
Royal Astronomical Society of Canada, The, National Officers and Council for 1974, 214; Minutes of the Annual Meeting, June 29, 1974 (*Fidler*), 215; New Service Awards (*Halliday* and *Williams*), 218.

S

Scarfe, C. D., A Time of Minimum for HD 217312 (with D. J. Barlow), 96.
Sears, R. L., Origin of the Chemical Elements and Stellar Evolution, 1.
Shuter, W. L. H., The 4.57m Millimetre Wave Telescope at the University of British Columbia (with W. H. McCutcheon), 301.
Simard, Henri, 1922–1973, *Malcolm M. Thomson* et *Martine Normandin*, 53.
Skinner, Ray, Gravity and its Astronomical Implications: An Elementary Guide, 173, 237, 307.
Smiley, Charles H. (see Review of Publications).
Solar Radio Flux, A 10.5 Year Period for the Slowly Varying Component of the, *A. E. Covington*, 31.
Spectrograph to Polish Observatory, Presentation of Canadian, 268.
Spectroscopic Binary with H and K Emission, BD + 47 781, A, *M. Pim FitzGerald*, 23.
Spheres, The Harmony of the, *Barbara R. Gaizauskas*, 146.
Stars in a Region in Puppis ($l = 246°$, $b = -0\overset{\circ}{.}6$), Distribution of Giant M and Carbon, *Kenneth A. Kirton* and *M. Pim FitzGerald*, 154.
Stars with Moderately Broad-Lined Spectra, Radial Velocities of, *D. P. Hube*, 143.
Stellar Evolution, Origin of the Chemical Elements and, *R. L. Sears*, 1.
Supernova 1970g in NGC5457, UBV Observations of, *John E. Winzer*, 36.

T

Telescope at the University of British Columbia, The 4.57m Millimetre Wave, *W. L. H. Shuter* and *W. H. McCutcheon*, 301.
Thomson, Malcolm M., Henri Simard, 1922–1973 (with Martine Normandin), 53.
Time of Minimum for HD 217312, A, *C. D. Scarfe* and *D. J. Barlow*, 96.
Truth, Science, and Language, *Alan H. Batten*, 285.
Turner, B. E., Interstellar Molecules—A Review of Recent Developments, 55.

U

UBV Observations of Supernova 1970g in NGC5457, *John E. Winzer*, 36.
University of Waterloo Observatory, Contributions, No. 24 (*FitzGerald*), 23; No. 34 (*Kirton* and *FitzGerald*), 154.

V

Variable Star Notes, *Janet Akyüz Mattei*, 48, 112, 169, 221, 281, 337.
Variations in the Profiles of the Gradual Rise and Fall Bursts for June 11–15 and a High Resolution Study for the Major Event of June 15, 1972, *A. E. Covington*, 225.

W

Walborn, N. R., Morphological Properties of Some Bright Southern Galaxies (with R. F. Garrison), 117.
White Light Observation of a Solar Flare, July 4, 1974, *Robert Pike*, 330.
Winzer, John E., UBV Observations of Supernova 1970g in NGC5457, 36.

the JOURNAL of the ROYAL ASTRONOMICAL SOCIETY of CANADA

devoted to the advancement of astronomy and allied sciences

Editor – Ian Halliday
Assistant to the Editor – Marie Fidler

Volume 68, 1974

Printed by
the University of
Toronto Press

CONTENTS FOR VOLUME 68, 1974

I. FEBRUARY

Origin of the Chemical Elements and Stellar Evolution	*R. L. Sears*	1
Interplanetary Material	*Peter M. Millman*	13
BD + 47 781, A Spectroscopic Binary with H and K Emission	*M. Pim FitzGerald*	23
A 10.5 Year Period for the Slowly Varying Component of the Solar Radio Flux	*A. E. Covington*	31
UBV Observations of Supernova 1970g in NGC5457	*John E. Winzer*	36
About Our Authors	*Miriam S. Burland*	40
Notes (Annual Meeting—Meteoritical Society: *J. E. Kennedy* and *M. R. Dence*; New Director of Royal Greenwich Observatory: *J. E. Kennedy*; Planetarium Educators to Meet in October)		41
Review of Publications (*Education in and History of Modern Astronomy* edited by Richard Berendzen; *The Milky Way: An Elusive Road for Science* by Stanley L. Jaki; *Black Holes* edited by C. DeWitt and B. S. DeWitt)		44
Variable Star Notes	*Janet Akyüz Mattei*	48

II. APRIL

Henri Simard, 1922–1973	*Malcolm M. Thomson* et *Martine Normandin*	53
Interstellar Molecules—A Review of Recent Developments	*B. E. Turner*	55
Fifteenth General Assembly of the International Astronomical Union, Sydney, Australia, August 21–30, 1973	*Graham Hill*	89
A Time of Minimum for HD 217312	*C. D. Scarfe* and *D. J. Barlow*	96
Modern Instrumentation for Optical Astronomy	*Francis J. Ahern*	99
About Our Authors	*Miriam S. Burland*	108
Notes from Observatories (Dominion Astrophysical Observatory)	*J. B. Hutchings*	109
Review of Publications (*Introduction à la cosmologie* par Jean Heidmann)		111
Variable Star Notes (Notes on Peculiarities on AAVSO Light Curves in 1973)	*Janet Akyüz Mattei*	112

III. JUNE

Morphological Properties of Some Bright Southern Galaxies	*R. F. Garrison* and *N. R. Walborn*	117
Radial Velocities of Stars with Moderately Broad-Lined Spectra	*D. P. Hube*	143
The Harmony of the Spheres	*Barbara R. Gaizauskas*	146
Observations of Comet Kohoutek	*J. B. Newton*	152

Distribution of Giant M and Carbon Stars in a Region in Puppis ($l = 246°$, $b = -0°.6$) *Kenneth A. Kirton* and *M. Pim FitzGerald* 154
About Our Authors *Miriam S. Burland* 163
Review of Publications (*Life Beyond Earth and the Mind of Man* edited by Richard Berendzen; *Gravitation* by C. W. Misner, K. S. Thorne and J. A. Wheeler; *The Revised New General Catalogue of Nonstellar Astronomical Objects* by Jack W. Sulentic and William C. Tifft; List of Books Received for Review) 164
Variable Star Notes (Notes on U Geminorum and Z Camelopardalis Type Variables During 1973) *Janet Akyüz Mattei* 169

IV. AUGUST

Gravity and its Astronomical Implications: An Elementary Guide (to be continued) *Ray Skinner* 173
Georges van Biesbroeck, 1880–1974 *Robert H. Hardie* 202
The Orbit and Nature of θ^2 Orionis A *G. C. L. Aikman* and *B. A. Goldberg* 205
About Our Authors *Miriam S. Burland* 213
Annual Meeting of the R.A.S.C. (National Officers and Council for 1974; Minutes of the Annual Meeting: *Marie Fidler*; New Service Awards: *Dr. Ian Halliday* and *Frederick R. Williams*) 214
Review of Publications (*Binary and Multiple Star Systems* by Alan H. Batten) 219
Variable Star Notes *Janet Akyüz Mattei* 221

V. OCTOBER

Variations in the Profiles of the Gradual Rise and Fall Bursts for June 11–15 and a High Resolution Study for the Major Event of June 15, 1972 *A. E. Covington* 225
Gravity and its Astronomical Implications: An Elementary Guide (continued) *Ray Skinner* 237
Fourth Meeting of the Canadian Astronomical Society at Memorial University of Newfoundland, St. John's, June 10–13, 1974 *Peter M. Millman* 257
Notes (Presentation of Canadian Spectrograph to Polish Observatory; Historic 15-inch Refractor Removed from Dome in Ottawa; Planetarium Programs) 268
Notes from Observatories (Dominion Astrophysical Observatory) *J. B. Hutchings* 275
Review of Publications (*Science Awakening II—The Birth of Astronomy* by Bartel L. van der Waerden; *The Redshift Controversy* by George B. Field, Halton Arp and John N. Bahcall; *Introductory Astronomy and Astrophysics* by Elske v.P. Smith and Kenneth C. Jacobs; *Astronomy and Astrophysics Abstracts*, Volume 9, edited by S. Böhme, W. Fricke, U. Güntzel-Lingner, F. Henn, D. Krahn, U. Scheffer, G. Zech) 276
Variable Star Notes *Janet Akyüz Mattei* 281

VI. DECEMBER

Truth, Science, and Language	*Alan H. Batten*	285
Note on the Widths of Radio Spectral Lines from Planetary Nebulae	*L. A. Higgs*	295
The 4.57m Millimetre Wave Telescope at the University of British Columbia	*W. L. H. Shuter* and *W. H. McCutcheon*	301
Gravity and its Astronomical Implications: An Elementary Guide (concluded)	*Ray Skinner*	307
White Light Observation of a Solar Flare, July 4, 1974	*Robert Pike*	330
Comments on the Radio Burst for the White Light Flare of July 4, 1974	*A. E. Covington*	332
About Our Authors	*Miriam S. Burland*	334
Review of Publications (*Shock Waves and Man* by I. I. Glass)		335
Variable Star Notes	*Janet Akyüz Mattei*	337
Index to Volume 68		341
Table of Contents for Volume 68		i to v